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## North American signal crayfish, *Pacifastacus leniusculus* (Dana) in the River Kelvin, Glasgow

William E. Yeomans<sup>1</sup> & Zara Gladman<sup>2</sup>

<sup>1</sup>Clyde River Foundation, Graham Kerr Building, University of Glasgow, Glasgow G12 8QQ.

E-mail: william.yeomans@glasgow.ac.uk

<sup>2</sup>Institute of Biodiversity, Animal Health and Comparative Medicine, Graham Kerr Building, University of Glasgow, Glasgow, G12 8QQ

E-mail: z.gladman.1@research.gla.ac.uk

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The invasive, non-native North American signal crayfish (*Pacifastacus leniusculus* Dana) was first recorded from Scotland in 1995 (Maitland 1996) and has since colonised at least 174km of river length in 13 catchments and several standing waters (Gladman *et al.* 2009; Sinclair, 2010). The species has an expanding population in the upper River Clyde and its tributaries, where it has been present since at least 1989 (Trudgill, 2000; Maitland *et al.*, 2001). The continued spread of signal crayfish in Scotland is of concern because it presents a significant risk to native biodiversity and for that reason was included in the Species Action Framework for targeted action for five years from 2007 (SNH, 2007).

A signal crayfish was caught by Mr David Scobbie in the River Kelvin at Glasgow University Science Park/Veterinary School (NGR: NS 55321 70494 – Fig. 1) on 3 August 2010 while fishing for trout using earthworms as bait. The adult female specimen was examined alive by the authors on 4 August 2010 (carapace length: 52.9 mm). On the nights of 4 and 5 August 2010, five Swedish trappy traps\* were baited with salmon-flavoured cat food and set in the immediate locality. During the second night, two adult males (carapace lengths: 53.8 mm and 55.4 mm – Fig. 2) were captured, confirming the occurrence of an established crayfish population.

Further investigations are necessary to assess the geographical extent and size of the Kelvin crayfish population. The capture of large adults suggests that signal crayfish may have inhabited this river for several years. Swedish trappy traps are biased towards catching large adults and so additional sampling using fine-meshed traps or electrofishing is required to confirm the presence of other age classes. Given the large size of the River Kelvin at the capture site (Fig. 1), there appears little hope of cost-effective eradication or containment but this must be assessed objectively.



**Fig. 1.** Looking downstream from the sample site, River Kelvin



**Fig. 2.** North American signal crayfish from the River Kelvin

This is the first record of crayfish from the River Kelvin and is significant because it is at least 65km from the nearest known record from the River Clyde (Clyde River Foundation, unpublished data) and considerably further following the line of hydraulic continuity, which also passes through a stretch of brackish water. The origin of the Kelvin crayfish therefore remains enigmatic. Among the possibilities, however, are deliberate human introduction; inadvertent human introduction (for example on clothing or angling equipment previously used in crayfish-affected areas); transfer by birds or other animals; or introduction by colonisation from hitherto unrecorded populations in water bodies adjacent to the river. It is extremely unlikely that the definitive route of entry to the Kelvin will be established.

The presence of crayfish in the Kelvin system also raises the possibility of cross-watershed migration to other river catchments and this is already considered a real threat at the Clyde-Annan watershed in the upper Clyde (Yeomans *et al.* 2010). The close proximity of the headwaters of some Kelvin tributaries (eg. the Allander and Glazert Waters) to those of the Endrick

system (Loch Lomond catchment) mean that vigilance is required to protect the natural heritage of Loch Lomond and its rivers from the ingress of North American signal crayfish.

We thank David Scobbie for access to the first specimen and the committee and members of the River Kelvin Angling Association for their support. The three specimens referred to in this note have been deposited in the Hunterian Museum Zoology Section, University of Glasgow [Voucher Numbers 140 273 (female) and 140274 (males)].

\*Trapping was conducted under licence from the Scottish Government. It is illegal to trap, be in possession of or transport live signal crayfish without a licence.

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